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Thursday, January 16, 20037:37 PM
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JSC STS-107 Launch Video Screening Report

JSC STS-107 Launch Video Screening Report

January 16, 2003

JSC Image Science and Analysis Group
Human Exploration Science Office *I* SX

ANOMALY **CANDIDATES**

No potentially anomalous events were noted during the screening of the STS-1O7 launch videos that were received. The long range tracking videos (second engin~ering replays) have not been sent via satellite to JSC. When the second replays are received they will be screened and a report will be sent to distribution.

QBSERVATIONS

The foilowing observations are not considered anomalous but are worth noting:

OTVO70 -The SSME ignition appeared normal on the video views. times for SSME ignition as seen on the OTVO70 video were:

SSME #3 SSME #2 SSME #1

15:38:55.218 UTC 15:38:55.371 UTC 15:38:55.468 UTC

The SSME Mach diamonds formed in the expected sequence (3,2,1). for the Mach diamond formation were:

SSME #3

15:38:56.769 UTC

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The start

The times

SSME #2 SSME **#1**

15:38:56.835 **OTC** 15:38:57.187 **UTC**

(The above engine start and Mach diamond formation times will be refined using the high speed engineering films during the film screening this weekend.)

OTVO51, OTVO70 -A small, white-colored flash was observed on the exterior of SSME i1 after SSME *ignition* (15:38:57.972 UTC). *This* flash was probably a *riece* of hydrogen burn *igniter* co~tacting the engine bell and *it* is not *considered* an abnormal event.

OTVO'O9, OTVO54,. OTVO63- Pieces of purge barrier material£rom the LH2
umbilical were seen falling aft along the -Z side of,the body flap during SSME ignition (15:38:57.203 UTC).

OTVOO9, OTVO54 -Right inboard and ou~board elevon motion was apparent during liftoff. Elevon motion during liftoff is a normal event. However, the elevon motion seen on STS-1O7 may have been greater than that tYl;>ically seen.

OTVO09 -A small light-colored piece of debris, probably debris from the SRB flame duct, was seen on the east *side* of the launch pad (between the RSRB and the body flap as seen on the east looking OTVO09 camera view) during liftoff (15:39:01.710 TJTC).

OTVO51 -A piece of RCS paper debris was seen falling from near the right
RCS stinger between SSME #1 and SSME #3 during SSME ignition (15:38:59.308
UTC) .

OTVO51 -A light-colored streak or flash was seen in the SSME #1 exhaust plume after SSME ignition (15:38:59.722 UTC).

OTVO09, OTV049, OTV054 -Typical of previous missions, multiple pieces of ice debris were seen falling from the ET/Orbiter Umbilicals and along the -Z *side* of the body flap during SSME ignition through liftoff. A single piece of Umbilical *ice* debris contacted the forward surface of the LO2 electric cable tray near the "LO2 Umbilical during SSME ignition (15:38:56.054 UTC). Ice debris was seen falling near the LH2 four inch recirculation line. No damage to the launch vehicle was noted.

OTVO51, OTVO70 -Orange vapor (possibly free burning hydrogen) was seen forward of the SSME rims during SSME ignition. Orange vapor forward of the SSME rims during SSME ignition has been seen on previous mission films and videos.

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OTVO6l-Frost and vapors were visible on the -Y ET GOX vent louver prJ.or to liftoff. Frost on the ET vent louvers has been seen on previous

mission
videos.

OTVO60, OTVO7l -The GH2 vent arm retraction and latch back appeared normal or the launch video views.

OTVOSO, OTVOSI -Ice debris was seen fc11ling from the LH2 and LO2 T8M T':'O
umbilical disconnects at liftoff.

OTVO51- A piece of probable SRB flame duct debris was seen aft of the LSRB
during liftoff.

KTV4A, KTV13, KTV21A -Light or orange-colored flares in the SSME exhaust plume were seen during ascent at the following times:

15:39:12.468 UTC 15:39:14.550 UTC 15:39:33.390 UTC 15:39:33.441 UTC 15:39:35.609 UTC

15:39:40.332 **UTC**

A large flare was seen at 15:39:37.160 UTC. Flares *in.*. the SSME exhaust plume during ascent are sometimes caused by debris contacting the SSME plume. Usually this debris *is* RCS paper. Flares in the SSME exhaust plume have been 'observed on previous mission videos.

KTV4A -A single, light-colored piece of debris was seen exiting the SRB exhaust plume during. ascent prior to SRB separation. This debris was probably instafoam from the aft end of the SRBs. The debris was seen at
15:40:19.871 UTC.

Other normal events observed included:

RCS paper debris from SSME ignition through liftoff, ice /'frost on SSME purge drain-line vents, ET twang, ice and vapor from the LO2 and LH2 TSM T-O umbilicals prior. to and after disconnect, acoustic waves in the exhaust cloud after liftoff, ET aft dome outgassing and charring of the ET aft dome after liftoff, vapor off the SRB stiffener rings, and the roll maneuver.

Normal pad events observed were:

Hydrqgen burn igniter operation, FSS and MLP deluge water activation, LH2 and LO2 TSM T-O umbilical disconnect and retraction, LH2 TSM door closure

NOTES

The STS-107 launch ofCo11.iInbia (OV-102) from Pad A occurred on ,Thursday, January 16, 2003 at 016:15:39:00,109 UTCas seen on camera OTV050. SRB separation occurred at approximately 016:15:41:06.500 UTC as seen on camera
KTV4A.

On launch day, 19 videos were received and screened. The second engineering l_ong range tracking videos were not received. The long range tracking videos will be screened upon receipt. Timing data was received on all of the videos received except KTV13.

The launch film screening will be conducted on Saturday and Sunday and a report will be sent to distribution on Monday, January 20, 2003.

Selec,ted launch views are available for viewing at the following web
address:

<http://sn-isag.jsc.nasa.gov/shuttleweb/rnission_support/sts-1O7/1aunch_video /lO71aunchvideo.shtrnl>

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